

The Newsletter of Engineering Heritage Australia



The
Institution of Engineers,
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2005 Colin Crisp Awards

During the Gala Dinner for the 2nd International Engineering Heritage Conference in Sydney in September 2005, the first presentations were made for the Colin Crisp Award since Engineering Heritage Australia re-badged the award as a National Engineering Heritage Award.

The principal award was made to Tasmania's West Coast Wilderness Railway, whilst a Highly Commended award was made to a stiff-leg derrick crane in Kyneton, Victoria.

The West Coast Wilderness Railway is a restoration of the original Mt Lyell Mining and Railway Co. Ltd railway, built on the edge of civilization in 1896 to transport copper concentrates from Queenstown to Strahan for export. It was a railway built in a time when rugged terrain was a foe to be conquered, not grand nature to be admired. And tame it they did, with a tortuous 34.5 kilometre route that demanded a leap into the unknown for company officials, engineers, contractors and labourers. This remarkable railway overcame incredible obstacles to enter its first life: its revival, also against the odds, truly makes it the railway that refused to die.

The restoration was a major engineering project with clear attention to heritage and the environment. Its completion offers major regional development, tourism and local community benefits to the Tasmanian West Coast region.

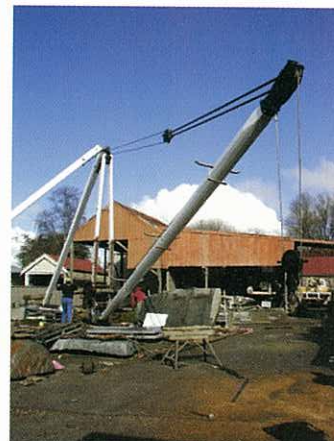
Engineers worked closely with the Tasmanian Heritage Council, environmental professionals, tourism entrepreneurs and railway operators to rebuild a railway in a remote location, through rugged terrain subject to landslips, high rainfall and flood-prone rivers. The restored railway closely follows the original route renowned for its environmental, historic, aesthetic, technical and social significance.

During the reconstruction phase engineers managed complex co-ordination and logistics challenges. Working in a strictly confined corridor with preservation of the natural environment and

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One of the conserved Abt locomotives prepares to leave Dubbil Barril, using the centre rack



The 1897 stiff-leg derrick crane at Kyneton, Victoria

Engineering Heritage International Activity Stationary Steam – an Example

Engineers Australia has declared 2006 as the Year of the International Engineer. In the spirit of this special year this article takes a look at what is going on beyond our shores in one fairly specialized area of Engineering Heritage activity.

Whilst I write a short column, "EHA is not Alone" in this Newsletter twice a year to look at what our like-minded colleagues are doing around the world, this can never be more than the briefest glimpse at what is happening worldwide in Engineering Heritage.

The Year of the International Engineer is our best opportunity to date to look around the world and look at what Australians and their international collaborators are doing in Engineering Heritage. One of the ways those who work in Engineering Heritage limit the size of the tasks they undertake is that they specialise. This article looks at just one of those areas of specialisation – that of Engineering Heritage in the area of Reciprocating Stationary Steam

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heritage paramount, forty bridges were built or refurbished and the rail tracks laid, including a central rack to engage with the Abt System pinions on the locomotives, allowing traction on steep grades. Elegant new carriages and station facilities have been built. Original historic Abt System locomotives have been refurbished to meet contemporary standards whilst retaining their impressive heritage qualities.

Sinclair Knight Merz were the project managers, JMG the civil engineers, and Hazell Brothers the civil contractors; Saunders & Ward rebuilt the locomotives. The award was presented to Federal Hotels & Resorts, the current owner/operator of the Railway.

The epic story of the West Coast Wilderness Railway is, above all, rich with people. Not just any people but West Coasters: hardy adventurers, courageous women, lively eccentrics, down-to-earth bushmen, daring entrepreneurs: true characters who add to its cultural heritage.

This large and complex project contains examples of almost every type of conservation process, from preservation and restoration to reconstruction and adaptation, all managed to a tight time frame and budget. The line was formally re-opened from Queenstown to Regatta Point on 27 December 2002.

The crane project in Victoria was very different. It was a much smaller project, involving only a limited cast of participants with modest resources. However it was a very closely managed project with a high level of detail and a very specific outcome to make the crane comply with modern regulatory standards whilst keeping the heritage fabric intact.

The stiff-leg derrick crane is located at Wm Thos Jones & Sons, Stonemasons, 11 Piper Street, Kyneton, Victoria. The crane dates from 1897 and is marked *HW Mould Clyde Forge, South Melbourne*. It is hand winched and is used for lifting and moving blocks of granite and basalts for general stonework operations such as cutting and polishing.

This stiff-leg derrick crane has a timber lifting arm known as a jib or boom, a mast and two stiff-leg timber members which support the mast. A cable supports the top of the boom and a load line running over the boom cable pulley at the top of the boom lifts the load. All the movements of the crane are hand operated.

Cranes of this type were used widely in the quarrying industry and the building industry in the days before the advent of the huge range of mobile lifting equipment which we expect on industrial and building sites today. The 1.5 tonne lifting capacity of the crane is modest but after more than one hundred years of service in the same stonemason's yard it was a useful piece of equipment that needed restoration. Both the stonemason's yard and the crane are listed on the Heritage Register in the State of Victoria. The stonemason's yard forms a significant part of a historic precinct that was once the centre of commercial activity in the town.

Richard Fooks, Engineer and Building Practitioner, was engaged by Stonemason Huntly Barton in late 2003 to inspect and assess the structure and mechanical components of the crane and make recommendations for repair and replacement of specific elements. The owner wished to continue to use the crane for day-to-day use in the business and hence sought additional advice on the ongoing operation and maintenance of the crane in order to address safe workplace requirements under modern legislation.

The crane underwent thorough structural analysis before it was repaired, all components were checked on reassembly, and the completed structure was tested and certified before being returned to service. Manuals were prepared to guide future operation and maintenance.



A reconstructed timber bridge on the West Coast Wilderness Railway

The crane restoration has ensured that future generations will be able to see it working in context in a precinct dating from the Victorian gold rush.

The awards to the two projects together set the rejuvenated Colin Crisp Award off to a very good start. Our objective for the next Colin Crisp Award in late 2007 is to attract a larger range of entrants but to maintain the high standards established by the 2005 awards.

Owen Peake

Historic Engineering Marker for the Tasmania Gold Mine

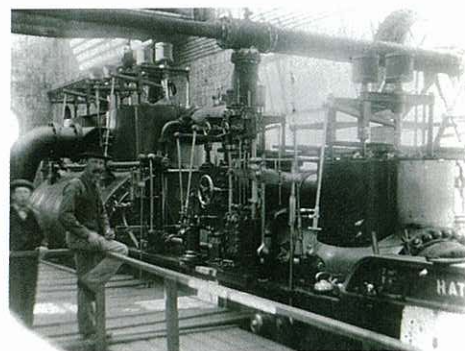
(The award of the plaque and this report predate the events which put this mine in the forefront of the news – Ed.)

The Tasmania Gold Mine at Beaconsfield in northern Tasmania operated from 1877 until 1914. Its main claim to heritage fame relates to the long series of steam pumping engines needed to maintain the water level in the mine below the current level of the workings.

Unfortunately the gold-bearing reef was located in a large zone of porous limestone which absorbed rainfall like a sponge. As the mine followed the reef down, water had to be removed in increasing quantities and from greater depths.

This process culminated in 1905-06 with the installation of what was said to be "the largest and most extensive pumping plant in the world". Three huge pumping engines were purchased from Hathorn Davey & Co. of Leeds, Yorkshire. Each engine had a high pressure cylinder diameter of 50 inches (1.27 m), a low pressure cylinder diameter of 108 inches (2.74 m) and a stroke of 10 feet (3.05 m). The engines constantly raised and lowered six pump rods in two shafts. Each pump rod weighed 170 tons and drove six cylindrical pumps located 500, 1000 and 1500 feet (457 m) below ground, 36 pumps in all. The capacity was 6.5 million gallons (30 million litres) per day.

A feature of the engines was the Davey Differential system of control which was capable of bringing the engine to a standstill very quickly in the event of pump rod breakage or loss of suction, a safeguard against catastrophic damage.



The Hathorn Davey engine



Grubb Shaft Museum

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Comparing the View

The second of a regular column by EHA Chair, Keith Baker

I mentioned windmills at Gilgandra in my previous column, and indicated that I would return to cover them in due course. Windmills, or wind powered water pumps to be more precise, have been part of the Australian landscape since the nineteenth century, and manufactured in Australia for over 100 years. This aspect of our heritage was plaqued by Engineers Australia in 2003 when a Historic Engineering Marker was unveiled on a Southern Cross Windmill at Toowoomba, where these most popular Australian windmills have been manufactured by the Toowoomba Foundry, and its successor Tyco Southern Cross, since 1903 (See EHA Newsletter No. 15). The particular machine was a composite of parts from several Southern Cross pattern IZ windmills. It was not an object that was particularly significant in its own right, but was highly significant in representing the class of Southern Cross Windmills of which over 200,000 have been manufactured. It was installed in a prominent location close to its historic place of origin.

The significance of the

windmills in Gilgandra is different, relating to their historic concentration of use in the locality. Known as the "Town of Windmills", Gilgandra once had a skyline dotted with them. As there was no reticulated town water supply until 1966 most residents supplied their own water needs from individual windmills which pumped water from the sub-artesian basin. By the 1950s there were over 300 windmills pumping water. Many have been preserved in a prominent row of different makes along the Newell Highway, and in the local rural museum where they feature alongside a Howard Rotary Hoe, a Gilgandra invention that has been plaqued elsewhere by Engineers Australia. On the highway I noted makes including Southern Cross, Alston, Metters, Horwood Bagshaw and Comet, whilst in the museum an interesting collection of Plavia, Iron Turbine, Southern Cross (with a 24 ft diameter windwheel) and various home-made windmills were on display.

When later driving in southern New South Wales, I was intrigued to see a most unusual design of windmill operating in a park at Jerilderie, a town more famous for Ned Kelly's hold-up of the post office. This machine, known as Steel Wing with its 25ft (7.62 m) diameter windwheel, has a double sided crank operating in a sliding frame, with the whole guyed tower pivoting from the base. It had been relocated from Goolgumbula Station where it was erected in 1910 and reassembled at Jerilderie to pump water at the lake. Its significance was its unusual design, its rarity, and its historic association with Goolgumbula Station near Jerilderie. It is believed to be the only surviving model of the 6 windmills built by the Steel Wings Company in North Sydney.

Whilst all of the windmills I have described were relocated from their original place of operation, they all had significance for their town or region. The precise place was not as important as the object or collection of objects, none of which would have been otherwise accessible to the public. It could be argued that Steel Wings would have retained even more significance if it had remained at Goolgumbula Station. But the fact that it was offered by the owners after storm damage for relocation and display suggest it would not have been maintained and would probably have been lost.

Sometimes when windmills are kept as monuments on the landscape their pumping mechanism is disabled or removed for safety reasons. The significance of those at the Gilgandra museum is enhanced by them being complete and operational, where the visitor can see the crank operating as the fan rotates in the wind, and count the strokes of the pump to see if it is geared or direct acting. Steel Wings has the additional claim that it is fulfilling its intended function in pumping water. Place is an important aspect of heritage significance, but these windmills illustrate some of the other considerations in determining their value as part of our engineering heritage.



Steel Wings at Jerilderie

Continued from page 2 Historic Engineering Marker for the Tasmania Gold Mine

The mine was reopened in 1999. Access is via the original Hart Shaft from which some pump rods and pumps were recovered during its enlargement and recommissioning. From the base of the shaft a decline extends down to 3200 feet (975 m). Electric pumps keep the mine dry.

By arrangement with the West Tamar Council, the plaquing ceremony date was set at 3rd December 2005 to coincide with the annual Beaconsfield Gold Festival, a family fun day in the mine area. However, when heavy rain fell two days beforehand, with more forecast, the Festival was cancelled, and the ceremony was moved indoors where the full complement of 50 people came along, undeterred by the weather. After a description of the pumping plant, Division President Dan O'Toole awarded the Historic Engineering Marker. The bronze plaque was unveiled by the new Governor of Tasmania the Hon William Cox and accepted by the West Tamar Council Mayor Barry Easter. The new mine manager Matthew Gill described current operations.

The Council has installed the Historic Engineering Marker on the front wall of the magnificent 1904 Grubb Shaft Engine House that is home to their excellent gold and heritage museum. The old mine, the new mine and the museum form one precinct in the centre of Beaconsfield.

Research on the whole series of pumping engines carried out by Owen Peake greatly facilitated the nomination of the mine for this award.



The Historic Engineering Marker plaque

Bruce Cole

Engineering. That is to say, the Engineering Heritage relating to steam engines used in factories, pumping stations, on ships, boats and other floating machinery and for many other mundane tasks which were manufactured from the latter part of the 18th Century to about the middle of the 20th Century. This area of specialisation does not include railway locomotives and road vehicles such as traction engines, trucks and steam-powered cars.

So where is this international Engineering Heritage activity located? The short answer is everywhere that has been touched by what we now call "western technology" but which, during its finest hour was called "Victorian technology". There is no doubt that it was the Victorian Era – generally the 19th Century – that saw the massive influence of British, European and (a little later) United States technology spread through the tentacles of the Colonial World to virtually every country. Certainly we find many examples of Victorian Engineering (some of it still hard at work) in such diverse corners of the world as Indonesia, Africa, The Caribbean, India and the countries of Eastern Europe. But the greatest concentrations of these relics are still in the countries of their origin – Britain, all the industrialized countries of Western Europe (but particularly The Netherlands, Germany and France) and the United States. The next most prolific locations of these relics are in the ex-colonies such as Australia and New Zealand; India, Pakistan and Bangladesh; Canada; Brazil; Argentina, Indonesia and South Africa.

But some of the following examples are surprising and we must delve back into our memory to understand why so much remains. Not far from our shores in Java (Indonesia) there is a huge sugar industry. Many of the hundreds of mills there are still driven by steam engines, mostly manufactured in the Netherlands, which was the Colonial Master in what is today the Republic of Indonesia. What is more surprising is that these mills are still hard at work, being driven to their mechanical limits by generations of engineers who have long since lost any memory of a Dutch presence in their country. But the makers' names are unquestionably Dutch to the core - and they built these great mill engines well. Australian and British Engineering Heritage researchers are now looking at these engines to try to ensure that they are preserved, or at least recorded, while they are still running.

Up until fairly recently in the Turkish city of Istanbul, which stands on the shore of the Bosphorus straits, there was a vigorous ferry service. The Turkish companies who ran the services never seemed to be concerned to replace their venerable, steam-driven ferries which moved remarkable numbers of people from the "Asian side" to the "European side" and back each day. In recent times bridges have been built to replace the ferries. While they



Steam engines driving sugar mill crushers at Sumberharjo Sugar Mill, Java.

canny Chinese businessmen have kept many quite ancient hulls in service. The Hong Kong people (including the Star Ferry Company) have lost their memory of the steam days but a New Zealand Engineering Heritage researcher has written much of the story and since his death an Australian is trawling for hidden fragments of memory.

In Mexico there are mines with ancient steam machinery, made in England, surprisingly, which has been retained in remarkably good condition. In Mexico City there is a museum with a collection of steam engines of a more recent era mostly having been retired from the oil industry. These relics were found by British and Australian Engineering Heritage researchers.

In an apparently idyllic tropical lagoon in a Pacific island called Chuuk an old Norwegian steam-powered whale chaser has recently been re-discovered by a British Engineering Heritage

researcher. It is fully restored, including its steam engine, and is operated as a dive tour boat. The placid lagoon which used to be called Truk Lagoon holds grim secrets. The wrecks of over a hundred Japanese ships litter its bottom, sunk in a devastating US carrier-led attack in the latter part of World War II: the wrecks now make a superb dive site.

Recent trips on the Nile River in Egypt revealed old paddle steamers, some still steam-powered and others converted to diesel in tourist service. Also the remains of Victorian Era steam-powered irrigation pumping stations dot the riverbank waiting to

be explored to give up their Engineering Heritage secrets.

There are many groups working in these specialised areas. In this area Australian researchers work with colleagues in New Zealand, the United States and Britain in particular with well known organizations such as the Newcomen Society and the Trevithick Society, The International Stationary Steam Engine Society and the Northern Mill Engine Society to name but a few.

By using international links, international organizations and by working with individual researchers around the world, Australian Engineering Heritage researchers can vastly increase the scope and quality of their work.

Owen Peake



Steam oil pumping engine at Science and Technology Museum, Mexico City.

Awarding Merit

Further awards have been made under the Award of Merit for Engineering Heritage program to recognise and show appreciation to members of Engineering Heritage Australia committees and groups and their supporters and collaborators. The award recognises significant voluntary service, often over many years, to the cause of engineering heritage.

An Award of Merit was presented to John Muirhead on 8 August 2005.

John Muirhead was one of the earliest members of the engineering heritage movement within Engineers Australia and was actively involved with its promotion and development for a considerable period.

He established the Sydney Historic Engineering Relics Subcommittee in 1978 (later the Engineering Heritage Committee) and became its first Chairman. He was not only the founder of engineering heritage in Sydney Division but continued to be its active leader for over 10 years. In this period he expanded the membership, developed the strategy for heritage activities, and represented heritage both on Divisional Committee and with external bodies.

His personal efforts brought about the high profile of the Engineering Heritage Committee within the Division and the introduction of engineering heritage to the Sydney community.

On the national scene he represented Sydney Division in the formation of the National Engineering Heritage Panel (now Engineering Heritage Australia). He was Sydney's member of the Panel for 11 years from 1978-1988 and its Chair for two years 1987 & 1988. During this time he conducted his own consulting engineering practice.

A further Award of Merit was presented to Dr Lenore Coltheart on 4 April 2005.

In 1985 Dr Coltheart became General Editor of the NSW Public Works Department's history series, which eventually comprised seven volumes. Dr Coltheart compiled her research findings into *A Guide to the History of the Public Works Department New South Wales*. This, together with the history series of books and two later publications, have provided valuable documentation of the history and works of the nation's first public works authority, which dates from 1856.

In 1990 Dr Coltheart co-authored with Departmental engineers the papers *A Heritage of Waste* and *Cylindrical Arch Dams of New South Wales, 1896-1908: "Work of a Courageous Nature"* that were presented to the 1990 Engineering Heritage Conference in Perth. The latter paper made a major contribution to the literature and is frequently cited.

Dr Coltheart, with the Chief Engineer Michael Clarke, initiated the Public Works Oral History Program in April 1991.

From 1996 to 1999 Dr Coltheart was the consultant historian for the Heritage Dams Project conducted by the National Committee on Engineering Heritage and the Australian National Committee on Large Dams. She also reviewed the *Historical Overview*, which has since become the publication *Australia's 500 Large Dams*, authored by Bruce Cole, past Chair of Engineering Heritage Australia.

Enquiries about the **Award of Merit for Engineering Heritage** can be made to the Administrator of Engineering Heritage Australia at (02) 6270 6525.

Owen Peake

When Is A Bridge Not A Bridge? When it's a long dining hall.

The Denison Bridge over the Macquarie River at Bathurst is the second-oldest metal truss bridge in New South Wales. It has been Classified by the National Trust, is on the NSW State Heritage Register and the Register of the National Estate; it was awarded a Historic Engineering Marker plaque by Engineers Australia in November 1995.

The bridge served to carry the Great Western Highway for 121 years until replaced by the 1991 incrementally-launched prestressed concrete bridge, whence the Denison Bridge was taken over by Bathurst City Council and has since been used as a pedestrian bridge, well, almost exclusively.

More historical and technical information can be obtained from the Plaquing Nomination Report and a 1993 Heritage Study of the Bridge prepared by the author for the Bathurst City Council.

But the cause for interest here is the adoption of the Denison Bridge as the venue for the Annual Lunch of the Bathurst Regional Eats and Drinks group (BRE&D), a voluntary collective of locals, chefs, restaurateurs, food producers and lovers of good food.

The 'long lunch' occupied the full length of the 3-span bridge and catered for 638 diners, a significant Live Load for the old structure.

Many well known bridges and other infrastructure have been venues for special events before, during and after service. Sydney Harbour Bridge has had its Open Days and has become a platform for fireworks. Many opening ceremonies have included public walk-overs or walk-throughs; special luncheon train trips with locomotive 3801 are very popular, but the only heavy-engineering dining venue known to the author was inside the 'grand hall' of the Dover Heights water reservoir in 1928.

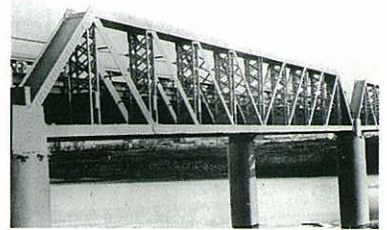
No doubt there are many other examples all over Australia that can be shared with colleagues.

Don Fraser

(Original "long lunch" report with thanks to Australian Country Style magazine)



The long lunch, photo by Sam McAdam for Australian Country Life



Denison Bridge, Bathurst, the fourth oldest metal truss bridge remaining in Australia



Former Sydney University students will recognize this name!

HMAS Diamantina

The Frigate Diamantina was laid down in April 1943, launched in April 1944 and commissioned into the Royal Australian Navy (RAN) in April 1945. She sailed out of Australian waters in June 1945 and did not return until December, well after the end of hostilities. The highlights of her war career were the surrenders at Bougainville, Nauru and Ocean Island where she was the venue for the Japanese surrender signings.

Diamantina was paid off to Reserve in August 1946 and recommissioned in June 1959 as a survey and oceanographic research vessel. On her first cruise in this role she charted the greatest depth recorded in the Indian Ocean. The underwater canyon 900 km off the Western Australian coast is 4.57 km deep and was named the Diamantina Deep.¹ She had another moment of glory in 1963 when she acted as Escort Vessel for the Royal Yacht Britannia during the Queen's tour. She was decommissioned a second time in January 1980 and was presented to the Queensland Maritime Museum in September 1980. She steamed to Brisbane in October 1980 and was placed in the Dry Dock at South Brisbane in April 1981. The museum intends to restore the ship to original condition.

The ship is of welded steel construction, 301 ft 6 in [91.9 m] long, of 36 ft 6 in [11.1 m] beam, 12 feet (3.7 m) in draught and with a displacement of 1420 tonnes. The ship had a cruising speed of 17 knots at 187 r.p.m. and a maximum speed of 20 knots.²

The machinery consists of two 2750 IHP [2050 kW] four cylinder inverted vertical triple expansion steam engines built by Walkers Ltd. of Maryborough, Queensland who also built the hull. All engine room auxiliaries, except the barring gear, are driven by reciprocating steam engines. Steam is raised by two Admiralty three drum boilers fired on furnace oil and operating at 225 p.s.i. [1550 kPa].

The fact that the ship went almost directly from service to preservation is reflected in the engine room appearance. Standing between the two big triples it feels as if all that is needed is a fire in the boilers and she would be ready for sea.

Armament consisted of two 4 inch guns, three Bofors 40 mm anti-aircraft guns and ten 20 mm Oerlikon anti-aircraft guns. The ship was primarily intended for Anti-Submarine duty and was equipped with four depth charge projectors and two forward depth charge rails.

The ship was one of 12 River Class ships in the Royal Australian Navy out of a total class of 65 ships. All of the Australian frigates were built in Australia. Commissioning dates ranged from 1943 to 1947. All the Australian ships were named after Australian rivers. The Diamantina is a large, ephemeral river running a thousand kilometres through the Outback of Queensland and South Australia. It looms large in the legends of the Australian Bush as do the Little Ships of the RAN in the history of World War Two.

Owen Peake

¹ Geoff Vollmer and Lew Lind, *Australia's Men O' War*, 1980.

² Peter Firkins, *Of Nautilus and Eagles -History of the Royal Australian Navy*, 1975.



HMAS Diamantina at Queensland Maritime Museum

HMAS Kara Kara

In the Australian National Maritime Museum at Darling Harbour in Sydney there is an unremarkable British-built triple expansion marine steam engine. The little ship from which this engine came played a colourful and significant part in Australian history.

Kara Kara was built in England in 1926 for Sydney Ferries Ltd as a car ferry across Sydney Harbour. As a car ferry she became redundant when the Sydney Harbour Bridge was completed in 1932. The relatively new ferry was laid up until 1941 when she was requisitioned by the Royal Australian Navy and converted as the Boom Defence Vessel, HMAS Kara Kara. It has been said that "her conversion left no recognizable features of her former days".¹ She was posted to Darwin where the harbour was protected by the longest anti-submarine boom in the world, along with six other Boom Defence Vessels.

The boom was made of meshed steel wire cable which stretched across the harbour from East Point to West Point. The first stage, completed in 1942, was 4.6 km long and it was extended later to a length of 5.59 km. The top of the cable was held up by buoys and, at intervals along the net, larger buoys were anchored to the seabed. The gate section was operated by two firmly anchored gate ships, HMAS Kara Kara and HMAS Gunbar.²

Kara Kara was in place as a gate ship on the morning of 19 February 1942 when the first Japanese air raid on Darwin occurred. She was strafed by Zero escort fighters, damaged, and two crew members, Leading Cook (Officers) Francis B Emms and Petty Officer F Moore were killed. Emms was awarded a Posthumous Mention in Despatches "for continuing to fire his machine gun although mortally wounded, thereby probably saving the ship and many of the ship's company".³

Kara Kara continued service in Darwin for the rest of the war and was paid off into reserve at the end of hostilities. She remained in Darwin until

December 1950 and then returned to Sydney where she languished in 'Unmaintained Reserve' at HMAS Waterhen. The ship was sunk during gunnery practice about 30 miles off Jervis Bay, in January 1973 by the combined gunfire of Skyhawk fighter-bombers and RAN frigates. However the engine was salvaged before the ship was sunk and spent many years in the open at the Goulburn Steam Museum until being moved to a prominent position in the Australian National Maritime Museum in 1988.

The ship was a double ended vehicular ferry with propellers at both ends with a displacement of 525 gross tons, 187 feet [57 m] long and 26.6 feet [8.1 m] beam with a top speed of 13 knots. In RAN service she was armed with a 12-pounder gun and two machine guns. The engine has cylinders of 16.5, 26 and 43 inch [419, 660 and 1092 mm] diameter and a stroke of 24 inches [610 mm] and developed 1295 IHP [966 kW] at 172 r.p.m. with a steam pressure of 180 p.s.i. [1240 kPa].

Owen Peake

¹ *The Navy in Darwin 1941-1943 – A Graphic Record from a Sailors Sketchbooks*, Pat Forster and Ted Egan, 1992, page 33.

² *The Navy in Darwin 1941-1943 – A Graphic Record from a Sailors Sketchbooks*, Pat Forster and Ted Egan, 1992, page 34.

³ *Royal Australian Navy Gallantry: Darwin 19th Feb 1942*, John Bradford, Appendix 1, page 31.



HMAS Kara Kara as a Boom Defence Vessel

Heritage Tour to Tasmania's West Coast



The "soakit hose" aka Lake Margaret's woodstave pipeline

During the March long weekend members of Engineering Heritage Tasmania and their partners headed to Queenstown to visit some historic engineering works.

In Tarraleah we stood on the upgraded lookout at the top of the six penstocks which fall in dramatic fashion to the power station far below. Displays erected on the platform include the Historic Engineering Marker plaque awarded to the Tarraleah Power Development by Engineers Australia in 1999.

In Queenstown we stayed at the Mountain View Motel which was originally the single men's quarters for Mount Lyell employees and has found a successful new life as tourist accommodation.

Next stop was the Lake Margaret hydro-electric power station built by Mt Lyell Mine in 1914 to supply the mine and Queenstown. We saw three of the seven machines busily (and noisily) pumping electricity into the State grid. Sadly the current owners, Hydro Tasmania, have just announced that the station will close on 1 July 2006. The 2.2 km long woodstave pipeline which carries water from the dam to the penstock is in urgent need of replacement. The cost of a new pipeline, other refurbishments and safety upgrades are major deterrents to continued operation.

All the original machinery and electrical equipment remain in place. The station houses a magnificent collection of historic photographs and artefacts in a wonderfully sound-proofed room. This scheme has very high heritage values, and we are keen to

see those values conserved in whatever future plans Hydro Tasmania may have for the scheme. A conservation management plan has been prepared and a community consultation group established.

Highlight of the weekend took place next day when we travelled on the West Coast Wilderness Railway from Queenstown to Strahan. Originally built in 1896 to transport copper concentrates to Strahan and closed in 1967, the railway was restored in 2002 and received the Colin Crisp Award for engineering heritage in 2005. At Lynchford station we were each given a bag of gold-bearing ore and shown how to wash away the stone, with the hope of seeing specs of magic metal left behind in the pan. At Halls Creek our ABT No. 5 loco engaged the rack rail and pulled us up to the Rynadeena Saddle. On the descent to Dubbil Barril we had spectacular views of the King River Gorge. At every station the thirsty loco took on more water. We had lunch on the platform at Dubbil Barril while the steam loco was turned around for its return journey.

After lunch and an inspection of an authentically reconstructed timber trestle bridge, we went on board a diesel-driven train for the remainder of the journey down the river. We travelled through magnificent rain forest and crossed the river twice. In Strahan there was time to enjoy the waterfront attractions, in surprisingly hot and humid weather, before the return by coach to Queenstown. (Photos of the railway can be found with the article on the Colin Crisp Award, elsewhere in this issue.)

On Monday morning we drove to Zeehan to visit the impressive mining museum with its extensive machinery, mineral and photographic displays. A nearby challenge was to drive through the 2.2 m wide old Spray Mine access tunnel, with very little clearance between our side mirrors and the tunnel walls. After lunch we returned to Hobart, enriched by our West Coast heritage experiences.

Bruce Cole



Lake Margaret Power Station

EHA Is Not Alone!

Several newsletters have been received in recent times from organisations with similar objectives to Engineering Heritage Australia. These contacts with like-minded organisations help EHA keep track of what is happening in the Engineering Heritage scene world-wide.

The Panel for Historical Engineering Works (PHEW) of the Institution of Civil Engineers in the UK publishes a quarterly newsletter. The September 2005 edition (Number 107) contained a very interesting story from The London Times in its "HEWs in the News" column: the newspaper reported that English Heritage (the UK government heritage body for England) had purchased what is considered to be the most at-risk building in England. The Ditherington Flax Mill near Shrewsbury, thought to be the world's first metal-framed building, was designed by Charles Bage and built in 1796-1797 alongside the Shrewsbury Canal. The building has a cast iron frame which, at the time, was a far more expensive material than the traditional wood and brick structures but it potentially saved mill owners so much money that it was quickly copied across the country. Bage recognised that the strength of metal, allowing him to create much larger internal factory spaces without columns. Metal structures also enhanced fire protection which was a major consideration at the time with many mills being destroyed by fire.

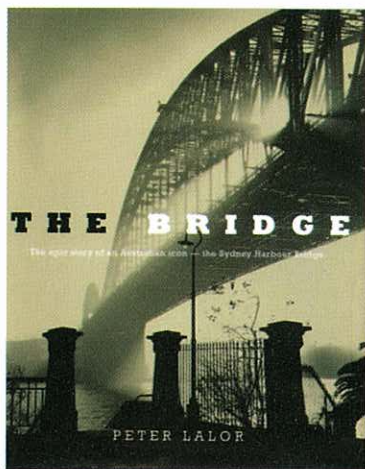
The Newcomen Society publishes a quarterly newsletter called "Links". The June 2005 edition (Number 194) reported that the Varberg Radio Station at Grimeton in southern Sweden, built in 1922-24, has been inscribed by UNESCO as a World Heritage Site. The station is an exceptionally well preserved monument to early wireless transatlantic communication. It consists of the transmitter equipment, including the aerial system of six 127 m high steel towers. Although no longer in regular use, the equipment has been maintained in operating condition. The 110 hectare site comprises buildings housing the original Alexanderson transmitter, short-wave transmitters with their antennae and a residential area with staff housing. The architect Carl Akerblad designed the main buildings in the neoclassical style and the structural engineer Henrik Kreuger was responsible for the antennae towers which were the tallest built structures in Sweden at that time. The site is an outstanding example of the development of telecommunications and is the only surviving example of a major transmitting station based on pre-electronic technology.

The Northern Mill Engine Society in Bolton, north of Manchester, reported in its December 2005 Newsletter that the new Boiler House building at its museum was now complete. The Boiler House was constructed of bricks recycled and cleaned from the adjacent Atlas Cotton Mill when it was demolished some years ago. Work on services and installation of the boiler is now under way. When completed, the Boiler House will allow the large collection of steam engines in the museum to be operated on steam.

Owen Peake

Book review

Heritage is defined in terms of "cultural significance" and the publications of Engineering Heritage Australia are being changed to bring them in line with the totality of the cultural values by which heritage is now defined, legally as well as practically. This means that engineers can no longer concentrate on technical and historical aspects of heritage to the exclusion of the other criteria: "aesthetic, historic, scientific, social or spiritual value for past, present or future generations" is how cultural significance is defined by the Burra Charter. In the revision of both the *Engineering Heritage and Conservation Guidelines* and the *Guide to the Australian Historic Engineering Plaquing Program* the concept of cultural significance has been brought into line with the Burra Charter and the expanded lists of criteria now adopted by State and Commonwealth heritage legislation.



In the past most books on the construction of the Sydney Harbour Bridge, and there have been many, have concentrated on one or a few aspects of the bridge's construction, usually concentrating on the work itself with some of the lead-up machinations. It was with some pleasure, earlier this year, that I picked up some holiday reading in the form of *The Bridge*, by Peter Lalor, published by Allen & Unwin in late 2005. For the first time a book seems to have been written which encompasses

all aspects of cultural significance in its treatment of what it describes as "the epic story of an Australian icon". The author has been given unprecedented access to Bradfield family records and the late Richard Raxworthy, well known in Engineering Heritage circles for his conference papers, acted as history consultant to the author. The references are an invaluable resource.

The politics of the era is treated in an easy-to-read manner, including a sympathetic, but balanced, description of the New Guard and its place in society at the time. Of particular joy for holiday reading is the description of the trek by horse of the 10 year old Lennie Gwyther from his home in southern Victoria to attend the bridge opening. An entire chapter is given over to the continuing controversy of "who designed it", Bradfield or Freeman.

There are some quibbles, however. It is a pity, for example, that an editor was not employed who was technically competent: a photo caption referring to "electronic railway lines" is rather awry in describing 1920s' technology. There is also inconsistency to the point of frustration in the use of metric and imperial measure: some quotations use the original imperial values, with no bracketed conversion; in other places only metric values are given.

The social impact of the bridge's construction is also treated in some detail with emphasis being given to the stories of some people who occupied premises on the approaches who were evicted without any compensation. It takes very careful reading to discover that the cases so highlighted were those of people occupying premises with no legal lease arrangements in place: one wonders if the current legal system would have led to a different outcome.

I recommend the book to engineers at all stages of their careers.

Bill Jordan

John Monash Medal 2005

Engineering Heritage Australia (EHA) has awarded the 2005 John Monash Medal to Emeritus Professor Ray Whitmore AM Hon FIEAust.

In 1976 Ray Whitmore persuaded his fellow Queensland engineers that the recognition and recording of engineering history and heritage was an important activity, and he succeeded in forming an engineering heritage panel within the Queensland Division of Engineers Australia. He was chairman of that panel from 1976 to 1991.

Ray carried his energy and enthusiasm to the national level when Engineers Australia agreed to have a National Panel on Engineering Heritage (now Engineering Heritage Australia) with representatives from each Division. He was the founding chair of that panel. His guiding hand helped to lay sound foundations for the identification, recording, assessment and conservation programs developed and used by all Divisions.

The first of his 39 heritage-related papers was published in 1977. Since then he has authored six books and edited four more on topics in engineering heritage. His research and assessment skills have been widely sought by a range of organisations.

He presented papers on engineering heritage topics at several Annual Engineering conferences before organising and chairing the first National Conference on Engineering Heritage held in Brisbane in 1982. Biennial conferences have been held ever since, and he contributed papers on at least five occasions.

Between 1982 and 2000, Ray was a key member of the Historic Engineering Plaquing Committee of EHA which determines whether nominated engineering works are worthy of recognition as National Engineering Landmarks or Historic Engineering Markers. Over 100 works have been recognised in this way.

In 1988 he was elected to Honorary Fellowship of the Institution of Engineers, Australia for "conspicuous service to the profession" and for his "unequalled knowledge of engineering heritage in Australia". He served on the Queensland Heritage Council from 1992 to 1995, and contributed to many other history and heritage organisations in Australia and overseas.

Robin Black, Deputy Chair of EHA, presented Ray with the prestigious medal and the citation at his home in Brisbane.

This is the third time that the John Monash Medal for Engineering Heritage has been awarded. The previous winners were Professor Colin O'Connor FIEAust (2003) and Mr John Ross AM FIEAust (2004).

Bruce Cole



Emeritus Professor Ray Whitmore, on the left, being presented with the 2005 John Monash Medal by EHA Deputy Chair, Robin Black.